

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 000054788		FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/EP2004/008717	International filing date (day/month/year) 04.08.2004	Priority date (day/month/year) 06.08.2003	
International Patent Classification (IPC) or national classification and IPC C08L67/00, C08F291/00, C08L3/04			
Applicant BASF AKTIENGESELLSCHAFT			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>5</u> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>	
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>	

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

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International application No.

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Box No. 1

Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language _____ which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-22 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- nos. _____ as originally filed/furnished
- nos.* _____ as amended (together with any statement) under Article 19
- nos.* 1-10 _____ received by this Authority on 24.05.2005 with letter
- nos.* _____ received by this Authority on _____
- ☐ the drawings:
- sheets _____ as originally filed/furnished
- sheets* _____ received by this Authority on _____
- sheets* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to sequence listing (specify): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-10</u>	YES
	Claims	<u></u>	NO
Inventive step (IS)	Claims	<u>4, 8</u>	YES
	Claims	<u>1-3, 5-7, 9, 10</u>	NO
Industrial applicability (IA)	Claims	<u>1-10</u>	YES
	Claims	<u></u>	NO

2. Citations and explanations (Rule 70.7)

1. Novelty

Blends containing components (i) and (ii) in combination with a compound (iii) having a plurality of epoxide groups in the molecule are novel.

2. Inventive step2.1 Method according to claim 8 and use of component (iii) (polyepoxide) to improve the biodegradation rate (not currently claimed)

- Document D4 can be regarded as the prior art closest to the claimed subject matter. D4 discloses blends of (for example) polyesters and component (ii) in which compatibilisation is achieved by coupling the two polymer phases, which results in improved mechanical properties and biodegradability. In D4 the blends (prepared using the method of claim 8 in the present application, for example) are compatibilised by gradually modifying component (i) with an anhydride or glycidic ether and then reacting it with component (ii) (see D4, page 6, third paragraph).

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- In contrast to D4, the present invention uses an aliphatic-aromatic polyester rather than a purely aliphatic polyester.
- The applicant has shown (Table 3) that with **aromatic**-aliphatic polyesters the biodegradability is significantly improved by the use of a phase mediator, whereas with **purely aliphatic** polyesters (as in D4) it is significantly impaired. Since it is known to use epoxide groups, such as acid groups, as compatibilising groups for polyesters and component (ii) (see D4), it is plausible that epoxide reagents (iii) have the same effect as the anhydride reagents (MAH) used in the examples in the present application. Data is provided relating to the biodegradability of aliphatic and aliphatic-aromatic polyesters, but there is no data relating to compatibilised blends of components (i) and (ii). The technical effect of using aliphatic-aromatic polyesters instead of aliphatic polyesters (see Table 3) is unexpected, and therefore an inventive step can be acknowledged in respect of the claimed subject matter.

2.2 Independent claims 1, 7, 9 and 10

Document D1 describes blends of aliphatic/aromatic polyesters (i) with renewable raw materials (ii) (starch, cellulose etc.) in which compatibilisation of the polymers is achieved using an unsaturated carboxylic acid (e.g. MAH), which forms covalent bonds with components (i) and (ii). This produces blends

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- with excellent biodegradability and improved mechanical properties. The method corresponds to that of the current claim 7. Since the main components (i) and (ii) are the same and the problem of interest is the same, document D1 is considered to be the prior art closest to claims 1, 7, 9 and 10.
- The difference between the product claimed in the present application and that of D1 is that in the present application a compound containing a plurality of epoxide groups (iii) is used instead of the unsaturated carboxylic acid.
 - Since no technical effect has been demonstrated for this distinguishing feature (assuming that polyepoxides have a compatibilising effect similar to that of MAH), it may be assumed that the claimed method will produce further compatible blends with properties similar to those described in D1.
 - It is known from D4 to achieve compatibilisation between a (purely aliphatic) polyester component and component (ii) by crosslinking with epoxide groups (glycidic ether) (using a method as defined in the current claim 8). On the basis of D1 it is obvious that compatibilisation can be achieved in the way suggested in D4 instead of using MAH in order to solve the aforementioned problem.